

What is claimed is:

1. A system for channelizing an IF wideband input signal into separated channelized digital output signals, the system comprising,

a complex mixer for quadrature demodulation of the IF wideband input signal into a complex signal,

a polyphase clock generator for generating polyphase clock signals each having the same clocking signal that is staggered in phase over a clock cycle,

a parallel converter comprising a bank of samplers for respective sampling the complex signal into staggered sampled complex signals and comprising a bank of converters for converting the staggered sampled complex signals into respective sampled digital complex signals, each of the samplers of the bank of sampler sampling the complex signals at a rate of the clock cycle at a respective staggered phase, and

a parallel filter bank comprising a polyphase filter bank of filters for respective filtering the sampled digital complex signals into respective filtered complex signals and comprising a processor for transforming the filtered complex signals into the channelized digital output signals.

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2 2. The system of claim 1 wherein,

3 the processor is a Fast Fourier Transform processor for  
4 computing N point Fast Fourier transforms of the N filter  
5 complex signals once every clock cycle of  $(f_s/N)^{-1}$  seconds.  
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7 3. The system of claim 1 wherein,

8 the polyphase filter bank comprises a plurality of digital  
9 filters each of which is a finite impulse response filter.  
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11 4. The system of claim 1 wherein,

12 the polyphase filter bank comprises a plurality of digital  
13 filters each of which is an infinite impulse response filter.  
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15 5. The system of claim 1 wherein,

16 the input signal comprises a plurality of channel signals  
17 that are frequency division multiple access signals having a  
18 channel bandwidth, and

19 the polyphase filter bank comprises a plurality of digital  
20 filters each of which having a bandwidth equal to 1/2 of a  
21 bandwidth of a respective channel signal in the input signal.  
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2 6. The system of claim 1 wherein,  
3 the input signal is an IF wideband signal communicating  
4 channel signals communicated within a channel bandwidth,  
5 the complex signal comprises I and Q quadrature baseband  
6 signals,  
7 the staggered sampled complex signals are staggered  
8 sampled I and Q quadrature baseband signals,  
9 the sampled digital complex signals are digitized  
10 staggered sampled I and Q quadrature baseband signals,  
11 the filtered complex signals are baseband channel signals  
12 within 1/2 of the channel bandwidth, and  
13 the channelized digital output signals are separated  
14 baseband channel signals.  
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7. A system for channelizing an IF wideband signal into  
channelized digital output signals, the system comprising,  
a complex mixer for quadrature demodulation of the IF  
wideband signal into a complex signal communicating channel  
signals communicated within a channel bandwidth, the complex  
signal comprises I and Q quadrature baseband signals,  
a polyphase clock generator for generating polyphase clock  
signals each of which having the same clocking signal that is  
staggered in phase over a clock cycle,  
a bank of samplers for respective sampling the I and Q  
baseband quadrature signals into staggered sampled I and Q  
quadrature signals, each of the samplers of the bank of sampler  
sampling the I and Q quadrature signals at a rate of the clock  
cycle at a respective staggered phase,  
a bank of converters for converting the staggered sampled I  
and Q quadrature signals into respective sampled digital I and  
Q quadrature signals,  
a polyphase filter bank of filters for respective  
filtering the sampled digital I and Q quadrature signals into  
respective filtered I and Q quadrature signals, and  
a processor for transforming the filtered I and Q  
quadrature signals into the channelized digital output signals.

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2 8. The system of claim 7 wherein,

3 the processor is a Fast Fourier Transform processor for  
4 computing N point Fast Fourier transforms of the N filter  
5 complex signals once every clock cycle of  $(f_s/N)^{-1}$  seconds, and  
6 the polyphase filter bank comprises a plurality of digital  
7 filters each of which is a finite impulse response filter.

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9 9. The system of claim 7 wherein,

10 the IF wideband signal comprises a plurality of channel  
11 signals that are in frequency division multiple access signals  
12 having a channel bandwidth, and

13 the polyphase filter bank comprises a plurality of digital  
14 filters each of which having a bandwidth equal to 1/2 of a  
15 bandwidth of a respective channel signal in the input signal.

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